

8 February 1979

MEMORANDUM FOR: The Director of Central Intelligence

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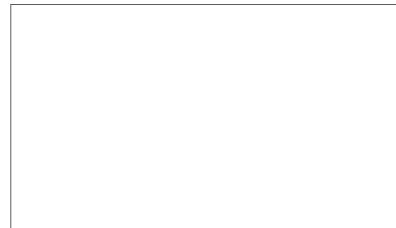
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[REDACTED]

SUBJECT : Managing the Improvement of Intelligence Analysis

Attached is a revised memorandum on "Managing the Improvement of Intelligence Analysis," sanitized to allow it to be distributed without insulting too many people gratuitously, as well as to clarify some points. Sanitization has suppressed some of the specifics which pertain to NFAC so I have annotated your copy to recall these specifics.

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8 February 1979

## MEMORANDUM

SUBJECT: Managing the Improvement of Intelligence Analysis

INTRODUCTION

The management goals of an intelligence analytic organization are twofold, answer the mail and improve the quality of analysis. The manager of any organization must always balance his efforts between such dual short- and long-term goals, a duality which creates a tension with a net strong pressure to concentrate on the immediate at the expense of the long term. Typically organizations go through maniac-depressive cycles in which long-term goals are neglected until a crisis situation forces a crash recovery effort. To establish the proper balance to avoid such cycles top managers must set up artificial mechanisms to increase the incentives of the organization to work on long-term goals all of the time.

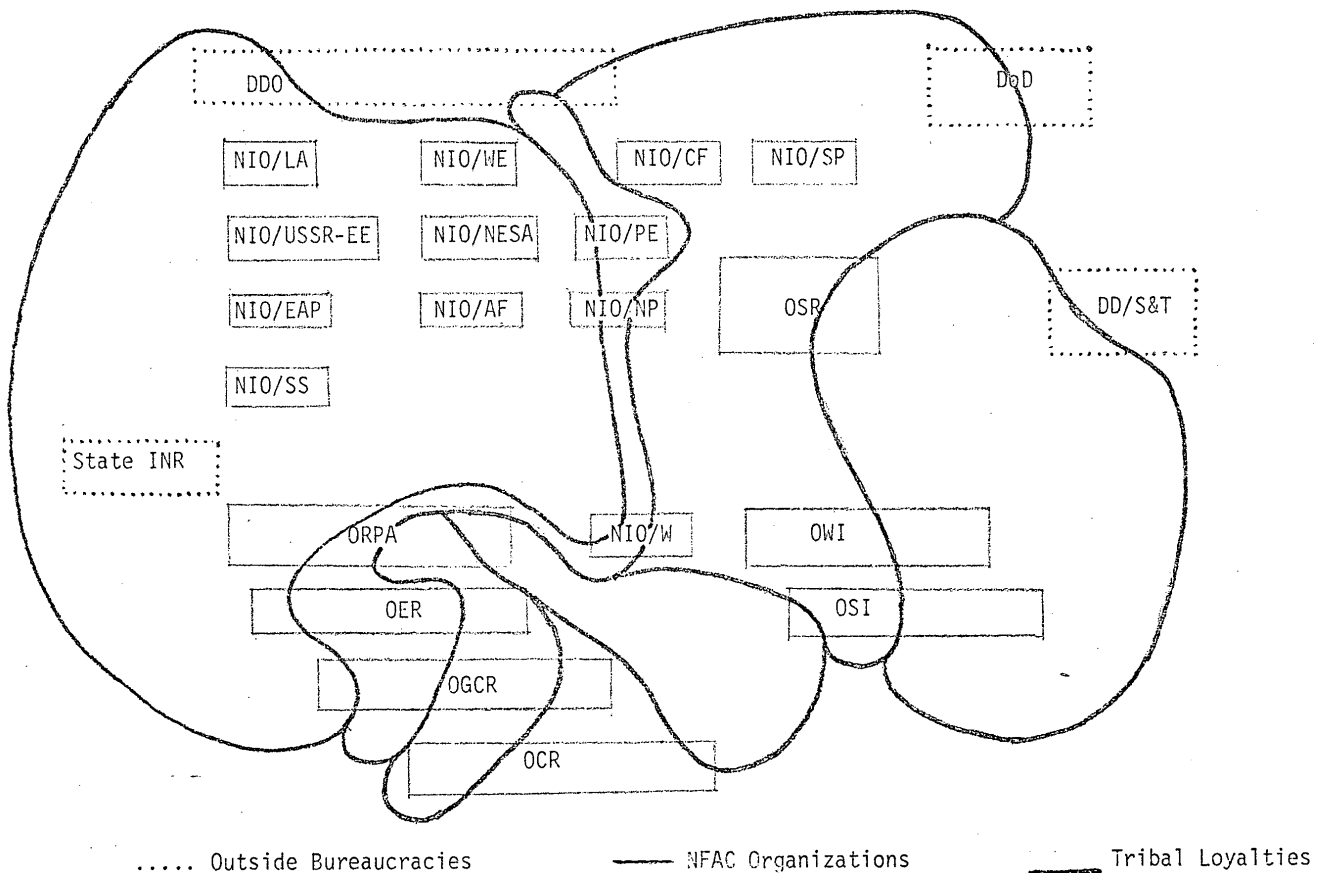
The rest of this paper will try to provide a useful framework for thinking about artificial mechanisms for increasing the priority of long-term goals of an intelligence analytic organization. However, before leaving the management problem of answering the mail, it is well to address one aspect of it in order to make clear what the remainder of this memorandum will not address. Part of answering the mail involves scheduling production. This involves some mechanism (variously called production board, scheduler or plan depending on agency) to decide how analysts are to be employed. It is self-evident that in the long run superb analyses of irrelevant problems are not all that much better than shoddy analyses of relevant problems. Good scheduling is closely related to improving analysis in terms of impact, but managerially is very different. Thus it is important to recognize on which side of the management tracks one is at any given moment, answering the mail or improving the quality of analysis. To respond to a particular problem in a way that is appropriate only on the "other side of the tracks" can do harm. What follows is intended to apply to mechanisms for improving the quality of intelligence analysis, but it presumes a functioning management tool for answering the mail.

For a mechanism to succeed in improving analysis it must be based on an appreciation of two dimensions of the problem, the conceptual and the temporal. Conceptually one must understand the structural relations among symptoms, causes and curatives of intelligence problems. Temporally one must understand the interactions over time among discovering symptoms, identifying causes and applying curatives which in turn create new causes while mitigating old ones. Failure to appreciate one dimension of the problem can be debilitating; failure to appreciate both will wreak havoc.

In asking how to manage the improvement of intelligence analysis we must recognize that the problem is tough. So we must be ready to grit our teeth and comb through the wool for awhile before we will have brushed out useful identifiable strands. When we are done with this combing the major threads which will emerge for management purposes will be:

- The conceptual framework one uses to think about this management problem is important. If our mental models are wrong our actions will be wrong too.
- Symptoms of intelligence problems will be categorized best in something we can call the "functions of intelligence."
- Causes of intelligence problems will be categorized best in another taxonomy that reflects the organization of the intelligence community.
- Curatives will fit into the same taxonomy as causes, but will be further constrained because there are things that cause problems that can't be changed by a manager; he must learn to live with them.
- Everything is complicated by the existence within the community of very different cultures. At the risk of belaboring the obvious the following page is a simplified picture of the cultural affinities that exist within one analytic organization, the National Foreign Assessment Center (NFAC). Symptoms, causes and curatives are different among cultures. Imposing an inapplicable curative on a particular office or directorate can be as bad as failing to impose an appropriate one.
- Viewed over time managing the improvement of intelligence involves pursuing several different tracks in parallel, e.g. searching for new symptoms while implementing curatives in reaction to previously identified symptoms.
- There is no simple solution. Rather there are a host of curatives which if applied judiciously and consistently can in time significantly ameliorate many of the symptoms.
- The process is so complex that it cannot be sustained without formal feedback mechanisms even if it did not have to compete for management attention with answering the daily mail.

A Simplified Cultural Map of the National Foreign Assessment Center and Surrounding Bureaucracies  
(or the Unnamed Tribes of the CIA\*)



\*Informal groupings of less than 100ish bureaucrats are not shown on this chart.

## CONCEPTS

At the risk of seeming to insult one's intellect, we will now address the conceptual dimension of managing the improvement of intelligence analysis beginning with a tedious rehearsal of well-known facts leaning heavily on the analogy of a physician's tasks. I do this to build a simple mental model to ensure we are agreed on that about which we are talking and also to help us explain the conceptual problems to *eg. like Congress and the press* people who will be impatient for a simple solution.

A physician sees a complex human made up of chemical compounds, neurological systems, etc. arranged anatomically. A student of intelligence also sees a complex body with several parts, most simply described by the acronym, CAD, Collection, Analysis and Dissemination. If he goes into each of these parts he finds further complexities.

Collection is the equivalent of the human senses of sight, hearing, touch and smell. It is made up of many disciplines the most important of which are described by the acronym, HIS.

- Human Intelligence: What we learn from newspapers, travelers, emigres and spies.
- Imagery: What pictures taken by cameras held by people, airplanes, satellites, etc. tell us.
- Signals Intelligence: What we learn from the way people use electromagnetic energy.

Analysis for the physician's subject involves the functioning of the brain and for the student of intelligence it does too. In intelligence it is made up of roughly four mutually supporting, but different, functions which can be captured in some catch-phrases:

- FACTS & FIGURES: Who's where? When does how much rain fall? How deep is the water? How big is it? How much does it cost?, etc.
- RECKONING & REPORTING: What happened yesterday or did nothing happen? What is the military capability of an assembly of men & machines? What is the productive capacity of this or that combination of mines, factories, roads and people? etc.
- PREDICTION & PROGNOSSES: What will happen tomorrow or next year? What are the critical factors influencing developments? What are the key uncertainties? etc.

-WATCH & WARD: Among all the futures that might unfold which ones are both sufficiently likely and sufficiently important to the US to raise a warning flag?

Dissemination for the physician involves speech and expressions. For the intelligence officer it involves packaging and delivering the encyclopedic results of the collectors' and analysts' work to serve a variety of customers;

- the President and his principal advisers,
- an array of government planners,
- negotiators at their meetings, and
- military commanders in combat,

balancing their needs to know many things against their ability to absorb information. One changes the focus, frequency and form of intelligence information to try to serve each consumer of intelligence.

So far this treatment of the conceptual dimension of managing the improvement of intelligence analysis has only made simplistic and arbitrary definitions of the stages in the flow of intelligence from source to consumer and of the functions of intelligence. But this is useful for two reasons. One is to make clear that because the rest of the discourse will focus on analysis, it is ignoring a large part of the problem. The other is to set the stage for discussing the ideas of symptoms, causes and curatives of problems of intelligence analysis. The framework within which symptoms will usually be treated best is the functions of intelligence, described by catch-phrases above.

Symptoms rarely appear directly equated to causes. For the physician the symptom of blurred speech could arise from a brain tumor, a pinched neck nerve, etc. For the intelligence manager the fact that an important consumer received an unpleasant surprise could arise (within the analytic part of his organization) from having lost a critical report, from analyst ignorance of how to piece together evidence, from analyst misallocation of effort, etc. Only infrequently will the physician or the intelligence manager see a symptom that directly equates to a cause so a major task for both specialists is relating symptoms to causes, i.e. diagnosis.

The framework within which causes are best viewed is different than the one for symptoms. For the physician it is the anatomical breakdown of the human body. For the manager of intelligence analysis it is the organizational body of his agency, e.g. NFAC. To the extent a symptom of an "intelligence failure" can be ameliorated by his actions, it must arise from a cause to be found in one or more of:

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NO RECORD OF A RESPONSE TO THIS  
MEMO IN EXEC. REGISTRY AS OF 17  
APRIL 1980.

EXT TO: JG AGV SUBORD  
- Item -

- The people who make up the analytic organization.
- The conditions under which those people work.
- The support given them in the form of working spaces, information, tools, etc.
- The management mechanisms of the organization.

Otherwise the "failure" is beyond the control of the manager of intelligence analysis; this is not to say that no manager can influence it, but if he can, he is managing more than just analysis. In fact most symptoms arise from a number of causes, some within collection operations, some within analysis, some within dissemination processes and some within the consumers themselves.

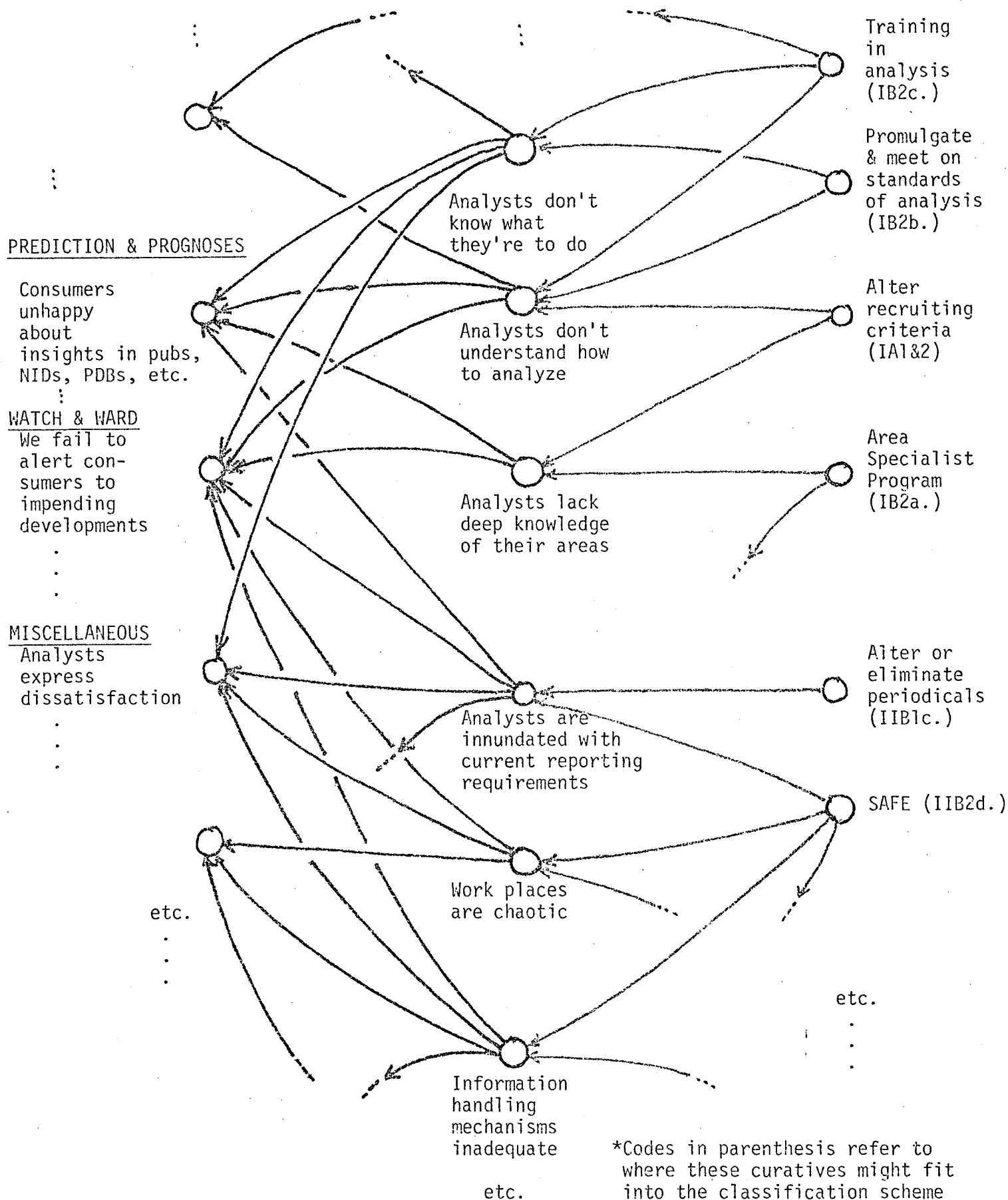
Having related symptoms to causes one then applies curatives in the hope of doing more good than harm. The physician deals in a multitude of palliatives, therapies and preventatives. The intelligence manager deals in an equally complex system. However, it will be useful to oversimplify by classifying the areas to which curatives may be applied as shown in the table on the next page. Note that this table is not intended to be complete in every detail, rather it is to display the broad framework and some exemplary detail.



# A TENTATIVE AND SIMPLIFIED CLASSIFICATION SCHEME FOR CURATIVES, ACTIONS TO IMPROVE THE QUALITY OF INTELLIGENCE ANALYSIS

- I. People for Analysis
  - A. Selection
    - 1. Recruiting Junior Analysts
    - 2. Recruiting Senior Analysts for Lateral Entry
    - 3. Firing
  - B. Training
    - 1. Initial
    - 2. Ongoing
  - C. Rewards and Incentives
    - 1. Promotion Policies
    - 2. Recognition
  - D. Numbers of Analysts
- II. Support of Analysis
  - A. Support at the Collection-Analysis Interface ✓
  - B. Support of Analysis
    - 1. Environment
      - a. Physical Surroundings
      - b. Information Flow
      - c. Intellectual Climate
    - 2. Analytic Techniques and Tools
  - C. Support at Analysis-User Interface ✓
    - 1. Editorial Functions
    - 2. Marketing Programs
    - 3. Presentational Means
- III. Mechanisms for Managing Analysis
  - A. Monitoring
  - B. Measurement
  - C. Management
    - 1. Feedback and control systems
    - 2. Manager selection and training

At this point we have laid out, admittedly in considerable abstraction, a conceptual framework for thinking about the management of intelligence analysis. Hopefully this will help avoid the common trap of confusing the management function with the substance of particular analyses. In any case one can conceive of a huge sheet of paper; down the left-hand margin are listed all the symptoms of intelligence analysis problems, down the center of the sheet are listed all the causes we have been able to identify with arrows drawn to the particular symptoms that revealed these causes, and down the right-hand margin are listed all the curatives we have undertaken or will undertake with arrows drawn to the causes that each curative will help. The next page is a small hypothetical excerpt from such a table.



When he has an approximation of this hypothetical huge piece of paper in some form, one can say that conceptually he grasps the management issues involved in improving intelligence analysis. Then he is ready to talk sensibly about how to make intelligence analysis better, that is to address the temporal dimension of the problem. Before doing so it is important to note that we are not talking about a big computer processed system, a slick-covered publication, or even necessarily a real "huge piece of paper"; one is talking about having a reasonably clear grasp of the structure of the problem. This is not an insurmountable task. In fact, in a moderate-sized organization (numbering perhaps hundreds of analysts and a couple dozen senior managers) it can be done in fairly short order, say in a month or two.

*By the Fall of 1977 NFAC management had the problem conceptualized adequately. Since then the momentum of the process has been lost and the conceptualization dissipated, but it could be rescued quickly.*

### MANAGEMENT SYSTEMS

In order to get better and to keep getting better one needs to march along five paths in parallel

- Push ongoing programs to get better.
- Get moving on a number of obvious programs that will help.
- Sort out remaining questions about what symptoms relate to what causes and what curatives will help.
- Look at what intelligence will be years in the future and map out how to prepare for it.
- Develop better measures of the quality of analysis.

Before discussing each path, it is worth observing that managing this requires a formal mechanism which serves as a monitor, a conscience and a prod. The mechanism needs to have several features.

- A responsible official.
- A description of the structure of relations among symptoms, causes and curatives.
- An explicit description of curatives and a process for evaluating if each is working.
- A regular feedback to management.
- An explicit program plan stretching over a reasonable planning horizon, e.g. five years. [redacted] troops and I had sketched out such a program for the Community by early 1978, but it died from "lack of transfer" when DD/NFA picked up this aspect of the ICStaff function. The corpse remains the best prototype available of what is needed.

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For concreteness let's think of this mechanism as one guy who keeps the huge sheet of paper described earlier. When he hears a new complaint (symptom) he enters it in the left-hand column and gets a manager to tell him appropriate causes and curatives to be listed in the middle and right-hand columns. This fellow also keeps a shelf of notebooks, one for each of the tentative categorizations of curatives introduced earlier. Each curative action is represented in one of these notebooks by a sheet which shows, among other things, causes and symptoms to be ameliorated by this curative, milestones to be achieved in applying the curative and the measures to be used to see if the curative is working. Our man also has a five-year program posted on his wall listing all curatives and showing the milestones associated with each. He spends his days playing with his three toys; checking his wall chart to see what milestones are coming up, leafing through his notebooks, making measurements on each curative as it approaches a milestone, and tracing out arrows on his huge sheet of paper to understand how his symptoms, causes and curatives interact. Once each fortnight he gives senior managers a report which includes:

- A list of newly discovered symptoms (and who is assigned to trace out causes and propose curatives for these).
- Proposals as to where he should search for new symptoms.
- A status report showing those curatives which are working markedly better or worse than expected.
- Proposals to modify curatives based on their impacts.

He leaves these biweekly report meetings with orders to relay to subordinate managers and guidance for his next two weeks' work.

Without making too much of this picture, the point is that some such management mechanism is critical. Otherwise things will fall through cracks; symptoms will be noted and then forgotten, causes will remain unidentified, curatives will be misdirected or will peter out prematurely. Furthermore some such mechanism is needed to show outside critics that the manager is in charge. The point here is that if one shows that one clearly understands one's problems and has a reasonable (not necessarily all that reasonable either) plan to solve them, one will be left pretty much alone. On the other hand a public display of ignorance or indecision is like bleeding in shark-infested waters.

If this management mechanism to improve intelligence is to work over a period of months and years it must cause us to proceed down the five paths in parallel. Tandem treatment would be nicer in some cases, but the sharks are not going to allow us this luxury. That we have not already been bitten badly is miraculous; such luck can't hold. Again the five paths are ongoing programs, new starts, resolving questions, futurology and measurement.

Ongoing programs are listed in several places; the 1977 Community response to the Senate Select Committee on Intelligence, NFAC's goals statement to the DDCI in the summer of 1978, the Community responses to DD/NFA's call for their programs (Fall 1978), and DD/NFA's input to Mr. Aaron in December 1978 on political intelligence. These lists provide a start. What is now needed for each of these is:

-Layout milestones (e.g. on a five-year planning horizon) for each curative program so one knows what specifically is to happen by when, e.g. replace broad generalities like, "Work with State [redacted] with specifics like, [redacted]

-Sort out what really is being done to improve analysis rather than for other reasons, e.g. several computer-related programs reported to the SSCI as programs to improve the quality of analysis really were attempts to get better answers to specific problems which only coincidentally would add something to our knowledge of how to do better analysis in general.

-Establish ground rules for describing each program so that programs can at least be compared to see if

-Things are falling between stools, e.g. if each office, NIO and agency were to list their consumers, I'll bet some important consumers would be unlisted. ✓

-We are inadvertently duplicating efforts, e.g. I'll bet that the duplication on contracted work is striking.

-We are responding to the wrong criticisms, e.g. applying curatives in NFAC/OSR, OSI or OWI in response to 90% of the public criticism of intelligence would be inappropriate because those criticisms are symptomatic of root causes that exist only in NFAC/ORPA and State/INR (and to a lesser extent in NFAC/OER).

-Define for each program some measures of success no matter how crude they may be. Unless such measures are argued out and used there will never be an adequate connection between our curatives and the causes of problems in intelligence. Classic cases of curatives pursued with no idea as to the causes to be corrected are to be found in our repeated bootless efforts in the audio-visual field.

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In addition to rationalizing and pushing ongoing programs there are a number of programs that we generally agree should be started even though little has been done to move ahead on them.\* Such a list was prepared for one agency in the Fall of 1977. Other agencies could quickly repeat the process which produced that list to provide new starting points. They could qualitatively lay out symptoms, causes and curatives and achieve a consensus on a few curatives that should be started promptly. No need to worry that they're not "optimal." If senior and middle management agree it's useful, get cracking. Of course as these new starts occur they need to be treated as described above for ongoing programs.

The third path is to resolve questions which still exist about the relations among symptoms, causes and curatives. These are more than moot because on the answers to these questions depend judgments about the efficacy of many proposed curatives. As noted earlier one objective is to ensure that we are not responding in one part of the intelligence community to a symptom that on careful examination will be seen to apply to another part. Pursuing this path does not involve major computer simulations or studies with scores of analysts writing appendices to reports and annexes to the appendices. Rather it involves revisiting each of the curative proposals which emerge with a small group of knowledgeable people to qualitatively study how it relates to causes and

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\*This and several subsequent statements are based on the results of an informal survey in NFAC in 1977. After digging through files and talking to people in and out of intelligence, one listed all the problems that any apparently sane person had claimed existed; these were a mixture of symptoms and causes because which-was-which had not been clearly sorted out. One then made another list of all the curatives which had been proposed. All NIOs and Office Directors (OD) were asked to review and comment on these lists. From these comments a big table was made, the rows of which corresponded to various proposed curatives, the columns of which corresponded to an NIO or OD, and each cell contained a comment on a particular curative by a particular NIO or OD. Studying this table showed that curatives fell into four classes, those which had substantial support (it is these which are meant by new starts), those which were generally opposed, those which were controversial in that expert opinion was pretty evenly divided, and finally (largely because the questions had not been formulated well) those on which no overall view was apparent. The last three groups need further study before deciding what to do with them. For information the final summary table of this exercise is attached showing how curatives were classified in late 1977 (not all copies of this memorandum). *I am not aware of any movement in several of these areas since then. The matter of new starts for NFAC could begin with this list.*

symptoms, what promise it holds for alleviating known problems and what costs it will incur both in dollars and in creating new problems. When the results of a dozen or so such working groups are collected after about a month managers will be in a position to accept some curatives and reject others; they'll still be left with some that require further study. Indeed one task of the overall management mechanism is to ensure that this process continues indefinitely. Whenever someone, not clearly a lunatic, claims to have found a new symptom, a new problem or a new curative, it deserves serious consideration by an ad hoc group and then by the senior managers of intelligence analysis.

The fourth parallel path is futurology. It is clear that an analytic organization, whether it is in business or government, has so much inertia that unless the manager can anticipate the future by his recruiting, training and other actions, he will always have a tiger by the tail. Therefore a part of the management mechanism should be to ensure that periodically, say biannually, we carefully ask questions like the following: In what environment will we work in five years, in ten years? What demands might be placed on intelligence? What capabilities might be available? What constraints now exist that seem most binding in terms of inhibiting evolution to meet reasonably possible new demands or to use new capabilities? What actions should be taken now to prepare for likely futures and to hedge against particularly significant unlikely futures? Answering such questions is inherently open-ended, but the management mechanism should codify the process of seeking answers. For example our one man staff can schedule a futurology review every two years on his wall chart, then ensure that somebody competent does it, and then feed the results of the examination into his overall management system.

The fifth path to be followed is to define measures of the quality of intelligence analysis. This task will be big initially and then will become a relatively small part of the process as the limits of what can be done are reached, rather quickly. The task will be big initially because so little has been done to articulate what it is that constitutes good intelligence analysis. With few exceptions, analysts have been subjected to capricious standards. The phrase attributed to Kissinger, "I'll know what I like when I see it," summarizes the situation. The concentration of management attempts to improve analysis on reviewing completed work rather than on counseling analysts before they are committed has exacerbated frustrations and made the lack of measures of the quality of intelligence analysis a major roadblock. The technique of criticism works well with small numbers of highly motivated students; it's disastrous when applied naked to a bureaucracy of hundreds of analysts who think they've already earned their spurs.

Clearly we need to admit that quality in intelligence analysis is fundamentally an aesthetic judgment. But we cannot let this be an excuse for doing nothing; neither should we hoist ourselves on our own yardstick just for the sake of having some formula or code that looks scientific. We will never have an explicit quantitative measure of analytical quality, but we can and must have explicit qualitative statements of our aesthetic criteria. Then we at least will be talking the same language; now we are in a tower of Babel. The process of making such explicit statements must start at once. Producing the first statement will be agony. It will be greeted with hoots and howls if we're lucky, or just quiet determined disdain if we're unlucky. In any event in the process of disciplining top management to adhere to what it promulgated and analysts to observe the same guidelines, several major flaws will be revealed. Correcting these will be painful. Thereafter the changes likely will be only marginal (even though the criteria remain imperfect) and the main effort along this path will be to prevent backsliding.

### SUMMARY

Having read all of the above (and believed it) a reasonable question to ask is, "What should one do?" The answer must be in two parts, management and motivation.

Management actions should start the system described here, or a reasonable facsimile of it. The critical parts to be started at once are:

- Prepare and promulgate an explicit statement of criteria for good intelligence analysis. (Doing this is a 1-2 week full-time task for one person.)
- Make the worksheets for each ongoing and generally-agreed-upon-but-not-yet-implemented program describing specific milestones, measures of achievement, etc. described earlier. (Laying out the guidelines for such worksheets will take 1-2 days; making up the worksheets for the programs of one agency will take about a month with several working groups involved.)
- Resolve remaining questions about proposed curatives which are not generally agreed. (The first cut should take about a month, again with several working groups involved.)
- Prepare a comprehensive picture (the "huge" sheet referred to before) of the relations between symptoms, causes and curatives. (This will take about a month of 1-2 people's time after the preceding steps are completed, if they're done properly.)
- Make somebody clearly responsible for improving the quality of intelligence analysis and nothing else. (Nominations can be provided by middle and senior managers.)



- Do the other things recommended in the preceding paragraphs afterward. (They are not as urgent as the "top five.")

Motivation actions are much less clear, but are no less important. The one management action that is necessary to motivation is the promulgation of an explicit statement of criteria for good analysis, but it is not sufficient. Other actions are clearly required, but I admit to much less clarity on the overall picture here than in the management area. Peoples' self-esteem, enthusiasm and sense of direction must be revived in some cases, and merely nurtured in others, while carrying out changes that can only be interpreted as a statement that what has been done in the past was not satisfactory notably in the area of policy-related, especially political, analysis.

In that light the following actions seem to be necessary parts of the process.

- Careful explanations of the promulgated criteria for good analysis in a spirit of, "You have done well, but the needs have changed so that we must adapt."
- Sympathetic searching out of and listening for symptoms of problems among the troops. Most of the symptoms at which we have looked up to now come from outside the organization.
- Care to avoid insulting the troops. This will involve saying on many occasions something to the effect of, "I'm accepting this because it's a good piece of work, but in the future I want you to modify your presentations in such and such a way."
- Care to avoid perturbing the troops. Changing analysis will be traumatic at best. One should be chary of compounding the problem by changing personnel management policies, shifting office spaces or taking other actions which will affect people's sense of security. Indeed one needs to actively work to squelch rumors and assure people of personal stability.
- Seek diligently for opportunities to praise or, failing to find these, for opportunities to show concern for the people's well-being.
- Recognize that, no matter what is done to motivate people, turning the tide will take months at best.

Finally one must, recognizing the different cultures, decide where in the organization of the Intelligence Community to place the initial emphasis. Each month that some program such as the one described here lays dormant the options close in. There is now less freedom to choose

than there was a year ago and another year hence there will be even less. As of early 1979 the focus must be divided in the following win, place and show order.

-The NIOs and their Assistants

-NFAC ORPA

-NFAC OER

-State INR

The NIOs are in first place rather than second because they are relatively easy to fix compared to ORPA. What is needed to make a major improvement is:

✓✓

-a clear definition of NIO & NFAC Office Director roles and missions, and much less important,

-filling out the ranks of the NIOs and their assistants with people who will complement one another (admittedly harder than the first point.)

OER noses out INR for "show" in the race primarily because it is bigger and has a unique position in the Intelligence Community.

Recall that this paper only addresses managing the improvement of intelligence analysis. By the time one has a program to handle the two or three most pressing areas, it's probably best to look elsewhere for the greatest remaining marginal returns. Thus by the time a comprehensive program is initiated to improve the quality of the NIOs', ORPA's and OER's analysis, one's attention probably should be shifted to the management of answering the mail (e.g. how is production planned?) or to collection as the places where managerial attention can reap dividends. Only when those grounds have been fished is it likely to be worthwhile to shift primary attention to the rest of NFAC, to State and to Defense analytic organizations.

Attachment (not all copies)

Having dwelled on the need to illuminate uncertainty and disagreement, we must recognize that at the end we have a moral obligation to provide the policymaker with our judgment. This is an awesome responsibility because we are not dealing with trivia. One refuge from this responsibility has been sought all too often in the past, that is to state Delphic conclusions which can never be disproved by events. The obvious solution of requiring the analyst or team to state categorically which hypothesis is true is not, however, workable because analysts simply do not (and cannot) know.

A reasonable (and workable although painful) compromise is to require stating the likelihood of each hypothesis being true. This can be done with at least three degrees of precision.

-Approximate probabilities. Recognizing that precise probability statements, say to the second decimal place like 93%, will normally not be worth the effort to produce, we should only aspire at most to approximate probability statements like 90% or 35%.

-Odds. One can give a somewhat less precise assessment by using odds based on whole numbers. A mathematician would say that this means little in principle. However, some people feel more comfortable saying "3 out of 4 chances" than "75% probability," and for whatever reasons, readers do seem to take statements like "even odds" or "50-50 chance" as being less precise than "50% probability."